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WASHING MACHINE AGITATOR

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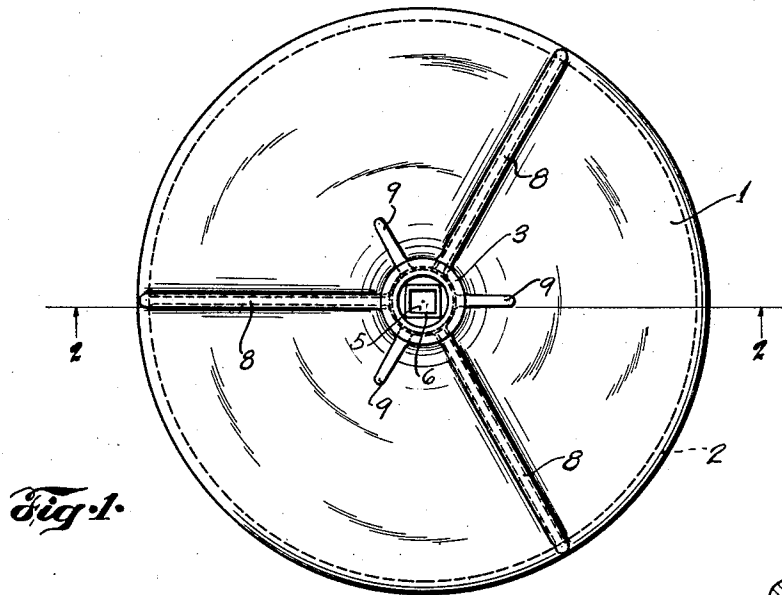


Fig. 1.

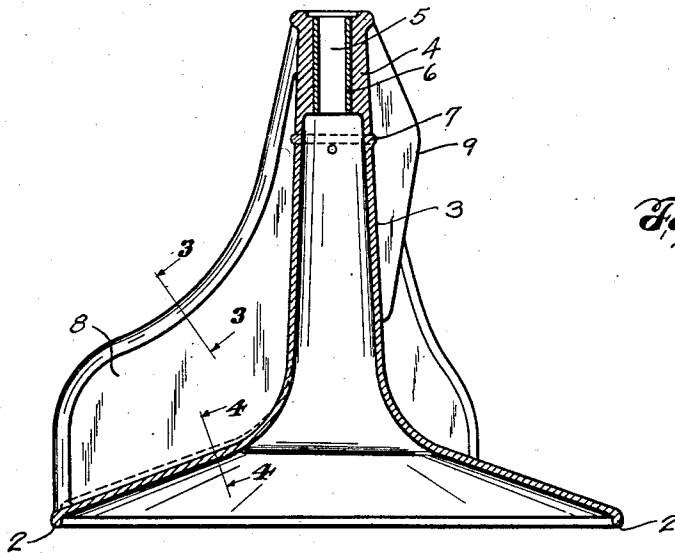


Fig. 2.

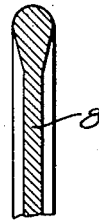


Fig. 3.

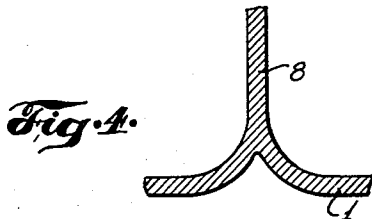


Fig. 4.

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WASHING MACHINE AGITATOR

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2 Claims. (Cl. 68—134)

This invention relates to washing machines and more particularly to improvements in agitators used in connection therewith.

Washing machine agitators of conventional design have radially extending blades or vanes which are adapted to be oscillated about a vertical axis. In most instances these vanes, or at least the major portions thereof, are disposed near the bottom of the tub or receptacle in which they operate, and they exert their greatest influence on the lower stratum of water in the tub, this having the intended result of creating a so-called secondary current, caused by the centrifugal forces set up on the tub's contents by the oscillating vanes. The centrifugal action is such as to cause the lower stratum of water and articles entrained therein to move radially outwardly, thence upwardly at the sides of the tub, inwardly toward the center post or stem of the agitator and downwardly, in the creation of a circular stream. The creation of the secondary current as described above is desirable since it tends to turn or rotate the articles being cleaned and causes all portions of the articles to be subjected to the cleaning action of the stronger primary currents. However, the articles tend to wrap about and become entangled with the upper stem portion of the agitator, which is probably due to the weakness of the secondary current in the upper central part of the body of water in the tub.

The principal object of the present invention is to provide an improved agitator of the character described especially designed and constructed to prevent the articles being laundered from collecting about and entangling with the agitator stem or blades, whereby to prevent undue wear of the articles and assure constant suspension and free movement thereof in the tub water. This object is accomplished by the improved shape and disposition of the main agitator vanes and the provision of auxiliary or subordinate vanes which are especially shaped and disposed with respect to the main vanes so as to agitate to a definite, although limited extent, the upper stratum of tub water and articles carried thereby.

Other objects and advantages will appear from the following description, considered in connection with the accompanying drawing wherein:

Fig. 1 is a plan view of my improved agitator; Fig. 2 is a vertical section taken on the line 2—2 of Fig. 1; Fig. 3 is an enlarged section of a portion of a main vane taken on the line 3—3 of Fig. 2, and Fig. 4 is an enlarged section taken on the line 4—4 of Fig. 2.

Referring now by characters of reference to the drawing, 1 indicates a circular disc of conical aspect, constituting the base of the agitator, the disc being provided with a depending flange 2 surrounding its outer edge. The disc 1 slopes inwardly and upwardly from its periphery towards a central area where it merges into a vertically projecting stem 3 of hollow or tubular construction.

The stem is formed at its upper end with a relatively thick wall portion 4 defining an axial bore or socket 5 of rectangular section, the socket-forming portion 4 being adapted to receive and frictionally embrace the square end of a shaft (not shown), constituting a part of the agitator drive mechanism. The agitator is preferably die-cast of a light weight metal such as aluminum or an alloy thereof, and in order to prevent undue wear and possible fracture of the stem 3 at its shaft-engaging areas a liner or bushing 6 of bronze or other suitable metal is secured within the socket-forming portion 4 of the stem.

Formed on stem 3 near its upper end is an annular bead 7 which serves as a mark for indicating the depth to which the agitator should be submerged in order to attain the most satisfactory and efficient results therefrom. The agitator is intended to be mounted in a tub with the flange 2 disposed adjacent the tub bottom, and the user is instructed to supply the tub with water sufficient to bring the water level even with the indicating mark 7. Thus the effective height of the agitator is that distance between its lowest extremity and the indicating mark 7.

The agitator is provided with a plurality of blades 8, preferably three in number as shown in Fig. 1, such blades projecting radially from the stem 3 and lying in vertical, symmetrically spaced planes. The blades 8 create the principal cleansing currents, and the major portion of their reaction surfaces are adapted to function in the lower half of the body of water in the tub. Thus, the outer margins of the vanes 8 rise vertically from the periphery of the base part a distance not more than one-half of the effective height of the agitator, and then slope inwardly and upwardly toward the stem 3, merging therewith at its upper end. It will appear that the maximum agitating influence of the blades 8 is upon the lower stratum of water since their radial extent is maximum and substantially constant at the lower half of the effective height of the agitator. Progressing upwardly from their vertical mid-sections the blades are of gradually decreasing radial extent, and accordingly these

blades have gradually decreasing influence upon the upper stratum of water in the tub.

In addition to the principal blades 8, above described, the agitator is provided with auxiliary blades 9 disposed in vertical, radial planes midway between the planes of the principal blades. The blades 9 are triangular in shape and have their portions of greatest radial extent at the level of the water surface indicating mark 7.

10 The radial extent of the blades 9 at the level of mark 7 is only a fractional part of the maximum radius of the agitator and preferably should not exceed one-third of the maximum radial extent of the principal blades. As best appears from

15 Fig. 2, the blades 9 extend downwardly from the plane of the indicating mark 7 to a point substantially half-way between such mark and the base of the agitator, the lower portions of the blades progressing downwardly with gradually decreasing radial extent. The portions of blades

20 9 which extend above the water level mark by preference likewise taper inwardly toward the stem.

From the foregoing description it will appear

25 that I provide an agitator having two sets of blades, the blades of one set being angularly displaced with respect to the blades of the other set. The blades of one set, for convenience termed the main blades, have their greatest agitating effect on the lower stratum of water in

30 the tub and their influence on the water in the upper stratum decreases gradually as such blades approach the water surface and at such level the main blades have practically no agitating effect. The auxiliary blades, however, will have

35 their greatest agitating influence (which is relatively small as compared to that exerted by the lower portions of the main blades) at or near the surface of the water, and will have no direct influence on the lower stratum of water. The

40 main blades 8 present concavely rounded surfaces where they merge into the base part of the agitator, as is shown in Fig. 4, and the edges of the blades 8 are formed with a rounded bead

45 which serves to strengthen these blades.

Although I have described my invention with reference to a presently preferred embodiment

thereof, it will be understood that various changes and modifications may be made in the device herein shown and described, without departing from the spirit and full intended scope of the invention as defined by the appended

5 claims.

I claim:

1. A washing machine agitator comprising a unitary structure having a substantially conical base portion of relatively low altitude and a

10 tubular stem rising centrally therefrom to a height above the normal water level of the agitator, a set of main blades extending radially from the stem, the outer margins of said blades rising substantially vertically from the periphery

15 of said base portion for a distance not more than one-half the effective height of the agitator, then sloping inwardly to meet the stem near its upper end, a set of auxiliary blades projecting radially from the stem, lying in vertical planes displaced

20 angularly from the planes of the main blades, the effective surfaces of said auxiliary blades being confined to the upper half of the effective height of the agitator, said auxiliary blades being of maximum radial extent at the normal water

25 level and tapering thereabove to the upper extremity of said stem.

2. A washing machine agitator having a disc-like base and a stem rising centrally therefrom, a plurality of main blades projecting radially,

30 substantially the full height of the stem, and having their lower extremities merging into the upper surface of the base, the upper portions of said blades being of gradually decreasing radial extent, a plurality of auxiliary blades projecting

35 radially from the stem and lying in vertical planes displaced angularly from the planes of the main blades, said auxiliary blades being confined to the upper portion of the agitator, the effective surfaces of the auxiliary blades progressing upwardly from their lower extremities

40 with gradually increasing radial extent, being maximum at the normal water level of the agitator, said auxiliary blades having portions rising above the normal water level, of gradually diminishing radial extent.

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